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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/990,849	11/21/2001	S. Jeffrey Rosner	10004322-1	2720

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EXAMINER

KIKNADZE, IRAKLI

ART UNIT

PAPER NUMBER

2882

DATE MAILED: 08/15/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/990,849

Applicant(s)

ROSNER, S. JEFFREY

Examiner

Irakli Kiknadze

Art Unit

2882

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 9-16 is/are allowed.
- 6) ☒ Claim(s) 1-8 and 17-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 November 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

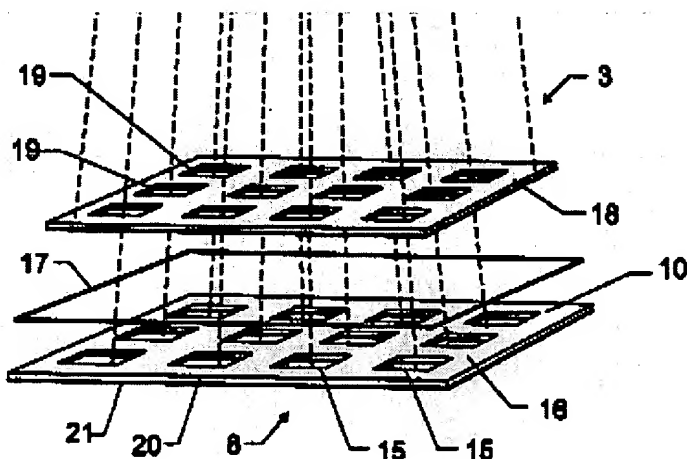
1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-8 and 17-26 are rejected under 35 U.S.C. 102(b) as being anticipated by Jalink, Jr. et al. (US Patent 5,844,242).

With respect to claim 1, Jalink teaches an imaging system (1) for imaging a sample of interest (5) comprising: an emitter (2) enabled to project imaging radiation (3) through the sample of interest (5), the emitter (2 and 4) is manipulable such that relative movement between the imaging radiation (3) and the sample of interest (5) is enabled; and a plurality of detecting modules (15) disposed in a sparsely distributed configuration



(Fig. 2a), including a first detecting module that is spaced apart from a neighboring second detecting module, said first and second detecting modules each having an array of sensors that are

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responsive to the imaging radiation (3), the detecting modules (15) are cooperatively aligned with the emitter (2 and 4) such that multiple the detecting modules (15) are simultaneously irradiated by a continuous pattern of the imaging radiation (3), the detecting modules (15) are cooperative with the emitter and the sample of interest (5) for detecting regions of the sample of interest to generate series of sub-images during the relative movement between the imaging radiation (3) and the sample of interest (5) (column 3; line 46 – column 4; line 44) .

With respect claim 2, the first detecting module and the neighboring second detecting module are coupled to an integrating unit (10) by respective first and second channels, the first channel being independent from the second channel, the integrating unit including processing circuitry for integrating the sub-images to form a composite image of the sample of interest (column 4; lines 4-44).

With respect to claim 3, the composite image includes one of a three-dimensional image and a two-dimensional slice of the three-dimensional image (column 3; lines 61-64).

With respect to claim 4, the detecting modules each include a substrate having a physically discrete array of sensors (column 4; lines 4-20).

With respect to claims 5 and 6, the emitter is disposed such that the imaging radiation is diffused from the emitter and is received by the multiple detecting modules at a projected angle (Fig. 2a). The detecting modules are configured to detect a plurality of successive ~~the~~ sub-images during the relative movement, the successive sub-images



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including a first sub-image having overlapping characteristics with a second sub-image (column 4; lines 26-35).

With respect to claims 7 and 8, an integrating unit (11) coupled to the detecting modules (15) for computationally combining the plurality of sub-images from <sup>the</sup> ~~ten~~ plurality of detecting modules to form a composite image (see abstract; Fig.1). The emitter comprises an X-ray tube (2) for projecting X-ray radiation. The emitter and the detecting module are on opposite sides of the sample of interest (Fig.1).

With respect to claim 17, A method of forming a composite image (see abstract) comprising the steps of: projecting timed pulses of x-ray radiation from a common source (2) through a sample of interest (5); providing relative movement between projections of the X-ray radiation (3) from source (2) and the sample of interest (5); exposing a sparsely distributed configuration of area detectors (15) to the pulses after passage through the sample of interest (15), such that spaced apart regions of the sample of interest (15) are imaged for each of the pulses; acquiring a plurality of sub-images corresponding to portions of the sample of interest during the relative movement by the area detectors (15); and processing the sub-images to form an image of the sample of interest (5) (column 3; line 46 – column 4; line 44).

With respect to claims 18-20, the step of acquiring includes collecting a sequence of sub-images corresponding to overlapping regions of the sample of interest by at least one of said area detectors during the relative movement, the step of processing including integrating the sequence of sub-images to generate the image (column 4; lines 26-44).

With respect to claim 21, the step of processing the sub-images includes forming one of a three-dimensional image and a two-dimensional view of the three-dimensional image of said sample of interest (column 3; lines 61-64).

With respect to claim 22, the step of exposing the plurality of area detectors (15) includes providing dedicated electrical connection between each of the area detectors and common processing circuitry so as to enable electrical isolation among the area detectors (Fig.2b).

With respect to claim 23, the step of integrating includes computationally combining the sequence of sub-images after offsetting spatially to match regions (column 2; lines 55-65).

With respect to claims 24-26, the step of combining includes algebraically adding said sub-images of the sequence. The step of combining includes selecting the sub-images having minimum artifacts (column 3; lines 10-25).

### ***Allowable Subject Matter***

3. Claims 9-16 are allowed.
4. The following is a statement of reasons for the indication of allowable subject matter: With respect to claims 9-16 prior art fails to teach or make obvious an X-ray imager for generating an image of an object comprising: a plurality of discrete sensor arrays including a substrate having a two-dimensional pattern of sensor elements, at least some of the sensor arrays being spaced apart from adjacent sensor arrays by a distance greater than one-quarter of a cross-sectional distance of the two-


dimensional pattern while being sufficiently close to enable a pulse of X-ray radiation to simultaneously irradiate a plurality of the sensor arrays as claimed in claim 9. Claims 10-16 are allowed by virtue of their dependence.

### **Conclusion**

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Lobregt et al. (US Patent 6,078,699); Diepstarten (US Patent 6,130,932); Malamud (US Patent 6,483,890 B1) and Linders et al. (US Patent 6,214,848 B1) disclose composing the X-ray images from sub-images.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Irakli Kiknadze whose telephone number is (703) 305-6464. The examiner can normally be reached on M-F(8:30-5:00). If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (703) 308-4858. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Irakli Kiknadze  
August 8, 2003

  
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